

### **ABSTRACT OF THE DISCLOSURE**

A liquid primary fuel is ignited by HCCI with the assistance of the early injection of a liquid pilot fuel. Pilot fuel injection and/or ignition are preferably controlled so as to permit the injected pilot fuel to become thoroughly distributed through and mixed with  
5 the primary fuel/air charge in the combustion chamber and vaporized prior to ignition.

Pilot fuel having a lower autoignition temperature will be ignited by compression ignition, followed by the ignition of the homogeneous mixture of the primary fuel and air.

HCCI combustion of the primary fuel is facilitated by 1) selection of the properties of the primary and pilot fuels and 2) obtaining a homogenous mixture of primary fuel and air by

10 injecting primary fuel into the engine's intake air stream in the form of finely atomized droplets having a mean diameter in the micron range.